

CLAIMS

1. A wireless communication method for use in a wireless terminal, the wireless communication method comprising:

transmitting, to a wireless network node, a random access preamble selected from a plurality of predetermined preambles for a random access; and

receiving, from the wireless network node, a configuration associated to the plurality of predetermined preambles,

wherein the configuration comprises disabling information for disabling at least one symbol group or at least one resource occasion of a plurality of reference preambles,

wherein the plurality of predetermined preambles is determined by disabling at least one symbol group of a plurality of reference preambles, wherein the plurality of predetermined preambles has a hopping between symbol groups for each of the plurality of predetermined preambles and the hopping is greater than 1 subcarrier spacing, and wherein the hopping is 6 subcarrier spacings.

2. The wireless communication method of claim 1, wherein a length of a cyclic prefix in the plurality of predetermined preambles is adjusted based on a maximum time offset related to the wireless terminal,

wherein a subcarrier spacing of the plurality of predetermined preambles is greater than twice the maximum frequency offset,

wherein a subcarrier spacing of the plurality of predetermined preambles is smaller than a reciprocal of the maximum time offset,

wherein a subcarrier spacing of the plurality of predetermined preambles is adjusted by at least one scaling factor,

wherein the subcarrier spacing of the plurality of predetermined preambles is adjusted by different scaling factors in different frames.

3. The wireless communication method of claim 1 or claim 2, wherein the plurality of predetermined preambles is determined by disabling at least one resource occasion in a plurality of reference preambles,

wherein the plurality of predetermined preambles has resource occasion gaps between every two symbol groups contiguous in frequency domain,

wherein the resource occasion gaps have different numbers of subcarrier spacings.

4. The wireless communication method of any of the preceding claims, wherein symbols in each symbol group for the plurality of predetermined preambles form one of a Zadoff–Chu sequence or a pseudo-noise sequence,

wherein a cyclic prefix in the plurality of predetermined preambles comprises at least one symbol in a tail of a symbol group of the cyclic prefix.

5. The wireless communication method of claim 1, further comprising:

receiving, from the wireless network node, a subcarrier spacing of the plurality of predetermined preambles, at least one scaling factor for adjusting the subcarrier spacing of the plurality of predetermined preambles, or a sequence of the at least one scaling factor.

6. A wireless communication method for use in a wireless network node, the wireless communication method comprising:

receiving, from a wireless terminal, a random access preamble selected from a plurality of predetermined preambles for a random access; and

transmitting, to the wireless terminal, a configuration associated to the plurality of predetermined preambles,

wherein the configuration comprises disabling information for disabling at least one symbol

group or at least one resource occasion of a plurality of reference preambles,

wherein the plurality of predetermined preambles is determined by disabling at least one symbol group of a plurality of reference preambles, wherein the plurality of predetermined preambles has a hopping between symbol groups for each of the plurality of predetermined preambles and the hopping is greater than 1 subcarrier spacing, and wherein the hopping is 6 subcarrier spacings.

7. The wireless communication method of claim 6, wherein a length of a cyclic prefix in the plurality of predetermined preambles is adjusted based on the maximum time offset related to the wireless terminal,

wherein a subcarrier spacing of the plurality of predetermined preambles is greater than twice the maximum frequency offset,

wherein a subcarrier spacing of the plurality of predetermined preambles is smaller than a reciprocal of the maximum time offset,

wherein a subcarrier spacing of the plurality of predetermined preambles is adjusted by at least one scaling factor,

wherein the subcarrier spacing of the plurality of predetermined preambles is adjusted by different scaling factors in different frames.

8. The wireless communication method of claim 6 or 7, wherein the plurality of predetermined preambles is acquired by disabling at least one resource occasion in a plurality of reference preambles,

wherein the plurality of predetermined preambles has resource occasion gaps between every two symbol groups contiguous in frequency domain,

wherein the resource occasion gaps have different numbers of subcarrier spacings.

9. The wireless communication method of any one of claims 6 to 8, wherein symbols in each

symbol group for the plurality of predetermined preambles form one of a Zadoff–Chu sequence or a pseudo-noise sequence, wherein a cyclic prefix in the plurality of predetermined preambles comprises at least one symbol in a tail of a symbol group of the cyclic prefix, further wherein the method further comprising:

transmitting, to the wireless terminal, a subcarrier spacing of the plurality of predetermined preambles, at least one scaling factor for adjusting the subcarrier spacing of the plurality of predetermined preambles, or a sequence of the at least one scaling factor.

10. A wireless terminal, comprising:

a communication unit, configured to:

transmit, to a wireless network node, a random access preamble selected from a plurality of predetermined preambles for a random access; and

receive, from the wireless network node, a configuration associated to the plurality of predetermined preambles,

wherein the configuration comprises disabling information for disabling at least one symbol group or at least one resource occasion of a plurality of reference preambles, and

a processor configured to determine the plurality of predetermined preambles by disabling at least one symbol group of a plurality of reference preambles, wherein the plurality of predetermined preambles has a hopping between symbol groups for each of the plurality of predetermined preambles and the hopping is greater than 1 subcarrier spacing, and wherein the hopping is 6 subcarrier spacings.

11. The wireless terminal of claim 10, further comprising a processor configured to perform a wireless communication method of any of claims 2 to 5.

12. A wireless network node, comprising:

a communication unit, configured to:

receive, from a wireless terminal, a random access preamble selected from a plurality of predetermined preambles for a random access; and

transmit, to the wireless terminal, a configuration associated to the plurality of predetermined preambles,

wherein the configuration comprises disabling information for disabling at least one symbol group or at least one resource occasion of a plurality of reference preambles,

wherein the plurality of predetermined preambles is determined by disabling at least one symbol group of a plurality of reference preambles, wherein the plurality of predetermined preambles has a hopping between symbol groups for each of the plurality of predetermined preambles and the hopping is greater than 1 subcarrier spacing, and wherein the hopping is 6 subcarrier spacings.

13. The wireless network node of claim 12, further comprising a processor configured to perform a wireless communication method of any of claims 7 to 9.